CLAIM AMENDMENTS

Claims 1 through 10 (canceled)

11. (New) A method for coproducing methanol and ammonia from natural gas, which comprises the steps of:

(a) mixing natural gas, steam and oxygen which has a purity of 90 to 99.5% in a catalytic partial oxidation reactor in the presence of a catalyst for reforming natural gas to partially oxidize and reform the natural gas into a gas mixture which comprises carbon monoxide, carbon dioxide, hydrogen and steam;

(b) dividing the gas mixture obtained in step (a) into two portions, a larger portion for hydrogen production and a smaller portion for methanol synthesis;

c) catalytically converting the carbon monoxide in the larger portion of the gas mixture for hydrogen production to carbon dioxide to obtain a gas mixture rich in hydrogen and carbon dioxide in a one or two stage catalytic converter, and cooling the gas mixture rich in hydrogen and carbon dioxide this produced;

(d) passing the gas mixture rich in hydrogen and carbon dioxide to a purification unit having a molecular sieve and maintained at a pressure of 30 to 100 bar, passing the gas mixture

rich in hydrogen and carbon dioxide through the molecular sieve using variable pressure absorption, to separate the carbon dioxide from the hydrogen, splitting the hydrogen into two streams, combining one stream of hydrogen with the smaller portion of the gas mixture obtained in step (b) for synthesis of methanol, and subsequently washing out any residual impurities from the other stream of hydrogen , including methane, carbon monoxide, and argon, with a stream of liquid nitrogen to obtain a pure stream of hydrogen and nitrogen for ammonia synthesis, and returning the washed out residual impurities as a fuel to the catalytic partial oxidation reactor according to step (a);

(e) catalytically converting the smaller portion of the gas mixture obtained in step (b) combined with the stream of hydrogen according to step (d) to methanol, and purifying the methanol by distilling the methanol at a pressure between atmospheric pressure and 15 bar; and

(f) catalytically converting the pure stream of hydrogen and nitrogen obtained according to step (d) to ammonia, and separating the ammonia by means of partial condensation.

12. (New) The process defined in claim 11, wherein according to step (a) a part of the natural gas is first fed through a steam reformer, in which at a temperature between 700 and 950°C, in a molar ratio of steam to carbon between 1.5 and 3.0, and at a pressure between 25 and 50 bar, the natural gas is catalytically converted to synthesis gas, and the synthesis gas is subsequently mixed with additional natural gas and fed into the catalytic partial oxidation reactor.

13. (New) A method for coproducing methanol and ammonia from natural gas, which comprises the steps of:

(a) mixing natural gas, steam and oxygen which has a purity of 90 to 99.5% in a catalytic partial oxidation reactor in the presence of a catalyst for reforming natural gas to partially oxidize and reform the natural gas into a gas mixture which comprises carbon monoxide, carbon dioxide, hydrogen and steam;

(b) dividing the gas mixture obtained in step (a) into two portions, a larger portion for hydrogen production and a smaller portion for methanol synthesis;

(c) catalytically converting the carbon monoxide in the larger portion of the gas mixture for hydrogen production to carbon dioxide to obtain a gas mixture rich in hydrogen and carbon dioxide in a one or two stage catalytic converter, and cooling the gas mixture rich in hydrogen and carbon dioxide this produced;

(d) passing the gas mixture rich in hydrogen and carbon dioxide to a carbon dioxide absorption column, and the carbon dioxide is washed out of the gas mixture to yield a gas mixture rich in hydrogen;

(e) passing the gas mixture rich in hydrogen to a purification unit having a molecular sieve and maintained at a pressure of 30 to 100 bar, splitting the hydrogen into two streams combining one stream of hydrogen with the smaller portion of the gas mixture obtained in step (b) for synthesis of methanol, and subsequently washing out any residual impurities from the other stream of hydrogen, including methane, carbon monoxide, and argon, with a stream of liquid nitrogen, to obtain a pure stream of hydrogen and nitrogen for ammonia synthesis and returning the washed out residual impurities as a fuel to the catalytic partial oxidation reactor according to step (a);

(f) catalytically converting the smaller portion of the gas mixture obtained in step (b) combined with the stream of hydrogen according to step (e) to methanol , and purifying the methanol by distilling the methanol at a pressure between atmospheric pressure and 15 bar; and

(g) catalytically converting the pure stream of hydrogen and nitrogen obtained according to step (e) to ammonia, and separating the ammonia by means of partial condensation.

14. (New) The process defined in claim 13, wherein according to step (a) a part of the natural gas is first fed through a steam reformer, in which at a temperature between 700 and 950°C, in a molar ratio of steam to carbon between 1.5 and 3.0, and at a pressure between 25 and 50 bar, the natural gas is catalytically converted to synthesis gas, and the synthesis gas is subsequently mixed with additional natural gas and fed into the catalytic partial oxidation reactor.

15. (New) The process defined in claim 13, wherein according to step (d), the gas mixture rich in hydrogen and carbon dioxide is compressed to aid in removing carbon dioxide from the gas mixture.

16. (New) The process defined in claim 15, wherein the gas mixture rich in hydrogen and carbon dioxide is washed with the help of a physical absorbent.

17. (New) The process defined in claim 16 wherein the physical absorbent is selected from the group consisting of cold methanol and glycolether.

18. (New) The process defined in claim 15, wherein the gas mixture rich in hydrogen and carbon dioxide is washed with the help of a chemical absorbent.

19. (New) The process defined in claim 18 wherein the chemical absorbent is selected from the group consisting of an alkanolamine, a polyalkanolamine, and potassium carbonate.

20. (New) The process defined in claim 13, wherein according to step (d) the carbon dioxide washed out of the gas mixture is used for urea manufacture.

21. (New) A method for coproducing methanol and ammonia from natural gas, which comprises the steps of:

(a) mixing natural gas, steam and oxygen which has a purity of 90 to 99.5% in a catalytic partial oxidation reactor in the presence of a catalyst for reforming natural gas to partially oxidize and reform the natural gas into a gas mixture which comprises carbon monoxide, carbon dioxide, hydrogen and steam;

(b) dividing the gas mixture obtained in step (a) into two portions, a larger portion for hydrogen production and a smaller portion for methanol synthesis;

(c) catalytically converting the carbon monoxide in the larger portion of the gas mixture for hydrogen production to carbon dioxide to obtain a gas mixture rich in hydrogen and carbon dioxide in a one or two stage catalytic converter, and cooling the gas mixture rich in hydrogen and carbon dioxide this produced;

(d) passing the gas mixture rich in hydrogen and carbon dioxide to a carbon dioxide absorption column, washing out the carbon dioxide of the gas mixture to yield a gas mixture rich in hydrogen, splitting the hydrogen into two streams combining one stream of hydrogen with the smaller portion of the gas mixture obtained in step (b) for synthesis of methanol, and introducing the other stream of hydrogen into a purification unit having a

molecular sieve and maintained at a pressure of 30 to 100 bar for subsequent ammonia synthesis;

(e) further introducing into the purification unit, a stream of liquid nitrogen for washing out any residual impurities from the other stream of hydrogen, including methane, carbon monoxide, and argon, to obtain a pure stream of hydrogen and nitrogen for ammonia synthesis and returning the washed out residual impurities as a fuel to the catalytic partial oxidation reactor according to step (a);

(f) catalytically converting the smaller portion of the gas mixture obtained in step (b) combined with the stream of hydrogen according to step (d) to methanol , and purifying the methanol by distilling the methanol at a pressure between atmospheric pressure and 15 bar; and

(g) catalytically converting the pure stream of hydrogen and nitrogen obtained according to step (e) to ammonia, and separating the ammonia by means of partial condensation.

22. (New) The process defined in claim 21, wherein according to step (a) a part of the natural gas is first fed through a steam reformer, in which at a temperature between 700 and 950°C, in a molar ratio of steam to carbon between 1.5 and 3.0, and at a pressure between 25 and 50 bar, the natural gas is catalytically converted to synthesis gas, and the synthesis gas is subsequently mixed with additional natural gas and fed into the catalytic partial oxidation reactor.

23. (New) The process defined in claim 21, wherein according to step (d), the gas mixture rich in hydrogen and carbon dioxide is compressed to aid in removing carbon dioxide from the gas mixture.

24. (New) The process defined in claim 23, wherein the gas mixture rich in hydrogen and carbon dioxide is washed with the help of a physical absorbent.

25. (New) The process defined in claim 24 wherein the physical absorbent is selected from the group consisting of cold methanol and glycolether.

26. (New) The process defined in claim 21, wherein according to step (d) the gas mixture rich in hydrogen and carbon dioxide is washed with the help of a chemical absorbent.

27. (New) The process defined in claim 26 wherein the chemical absorbent is selected from the group consisting of an alkanolamine, a polyalkanolamine, and potassium carbonate.

28. (New) The process defined in claim 21, wherein according to step (d) the carbon dioxide washed out of the gas mixture is used for urea manufacture.